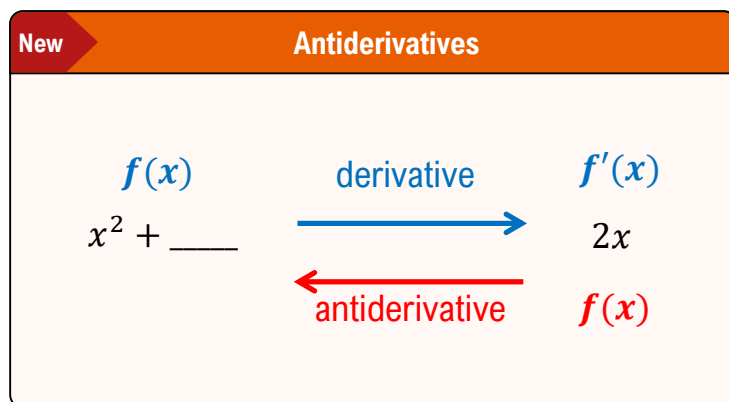


TOPIC: ANTIDERIVATIVES

Antiderivatives

◆ We know how to find the *derivative* of a function; finding the **antiderivative** is just the _____ process.

► If $f(x)$ is the **derivative** of the function $F(x)$, then we can say that $F(x)$ is an _____ **derivative** of $f(x)$.



EXAMPLE

Find the antiderivative of the following functions.

(A) $f(x) = 3x^2$

(B) $f(x) = 3$

(C) $f(x) = 0$

◆ When finding an *antiderivative*, check your answer by taking the *derivative* of it.

TOPIC: ANTIDERIVATIVES

PRACTICE

Find the antiderivative of the following function.

$$f(x) = 200$$

PRACTICE

Find the antiderivative of the following function.

$$f(x) = 5x^4$$

TOPIC: ANTIDERIVATIVES

PRACTICE

Find the antiderivative of the following function.

$$f(x) = 10x^9$$

TOPIC: ANTIDERIVATIVES

Finding a Particular Antiderivative

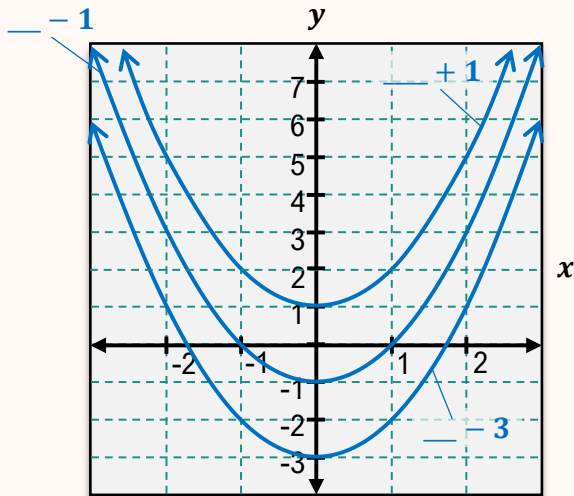
- ◆ The antiderivative of $f(x)$ is $F(x) + C$, which represents a _____ of antiderivatives.
 - Given a specific point on the antiderivative, we can solve for C , which gives us a _____ antiderivative.

EXAMPLE

Find the antiderivative of $f(x) = 2x$ given $F(2) = 3$.

New

Finding a Particular Antiderivative



$$f(x) = 2x$$

$$F(x) =$$

Find general antiderivative

$$F(\underline{\quad}) =$$

Apply given condition

$$= +C$$

$$C =$$

$$F(x) = x^2 \underline{\quad}$$

Write particular antiderivative

EXAMPLE

Find the antiderivative of $f(x) = 3x^2$ given $F(1) = 5$.

TOPIC: ANTIDERIVATIVES

PRACTICE

For the following function $f(x)$, find the antiderivative $F(x)$ that satisfies the given condition.

$$f(x) = 5x^4; F(0) = 1$$

PRACTICE

For the following function $f(x)$, find the antiderivative $F(x)$ that satisfies the given condition.

$$f(x) = 100x^{99}; F(1) = 101$$